



## Screening of novel microbial catalyst in Bioelectrochemical systems (BES)

Aryal, Nabin; Tremblay, Pier-Luc; Zhang, Tian

*Published in:*  
Book of Abstracts. DTU's Sustain Conference 2015

*Publication date:*  
2015

*Document Version*  
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

*Citation (APA):*  
Aryal, N., Tremblay, P-L., & Zhang, T. (2015). Screening of novel microbial catalyst in Bioelectrochemical systems (BES). In *Book of Abstracts. DTU's Sustain Conference 2015* [B-10] Technical University of Denmark.

---

### General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

## Screening of novel microbial catalyst in Bioelectrochemical systems (BES)

Nabin Aryal<sup>1</sup>, Pier-Luc Tremblay<sup>1</sup>, Tian Zhang<sup>1\*</sup>

1: Novo Nordisk Foundation Center for Biosustainability, Technical University of Denmark, Kogle Allé 6 DK-2970 Hørsholm

\*Corresponding author: zhang@biosustain.dtu.dk

Microbial Electrosynthesis (MES) is an artificial type of photosynthesis for microbial conversion of carbon dioxide (CO<sub>2</sub>) to organic chemical commodities when it utilizes the electricity from the solar cell. Some of acetogens, obligate anaerobic bacteria able to accept electrons from the cathode and produce chemicals. Until now, limited numbers of microorganisms have been defined for the cathodic reduction of CO<sub>2</sub> in MES system. The electron transfer rate from the cathode to the best electro autotroph *S. ovata* 2662, are still significantly lower than what is observed in bio-anodic processes with other electrotrophic bacteria. Hence, we are screening other pure cultures for better MES activities. With the objective of finding new cathodic biocatalysts, pre-selections of acetogens were done based on their performance in syngas fermentation technology. In our study, novel electrotrophic bacteria have been identified with the production rate of 368.8 mM per day per m<sup>2</sup> for 14 days, which is almost three-fold higher than the best reported result in the literature obtained with a pure culture of a different strain of *Sporomusa ovata*.

Keywords: - Microbial electrosynthesis, CO<sub>2</sub> reduction, *Sporomusa ovata*